School Shop

vol. XI no. 5

JANUARY, 1952

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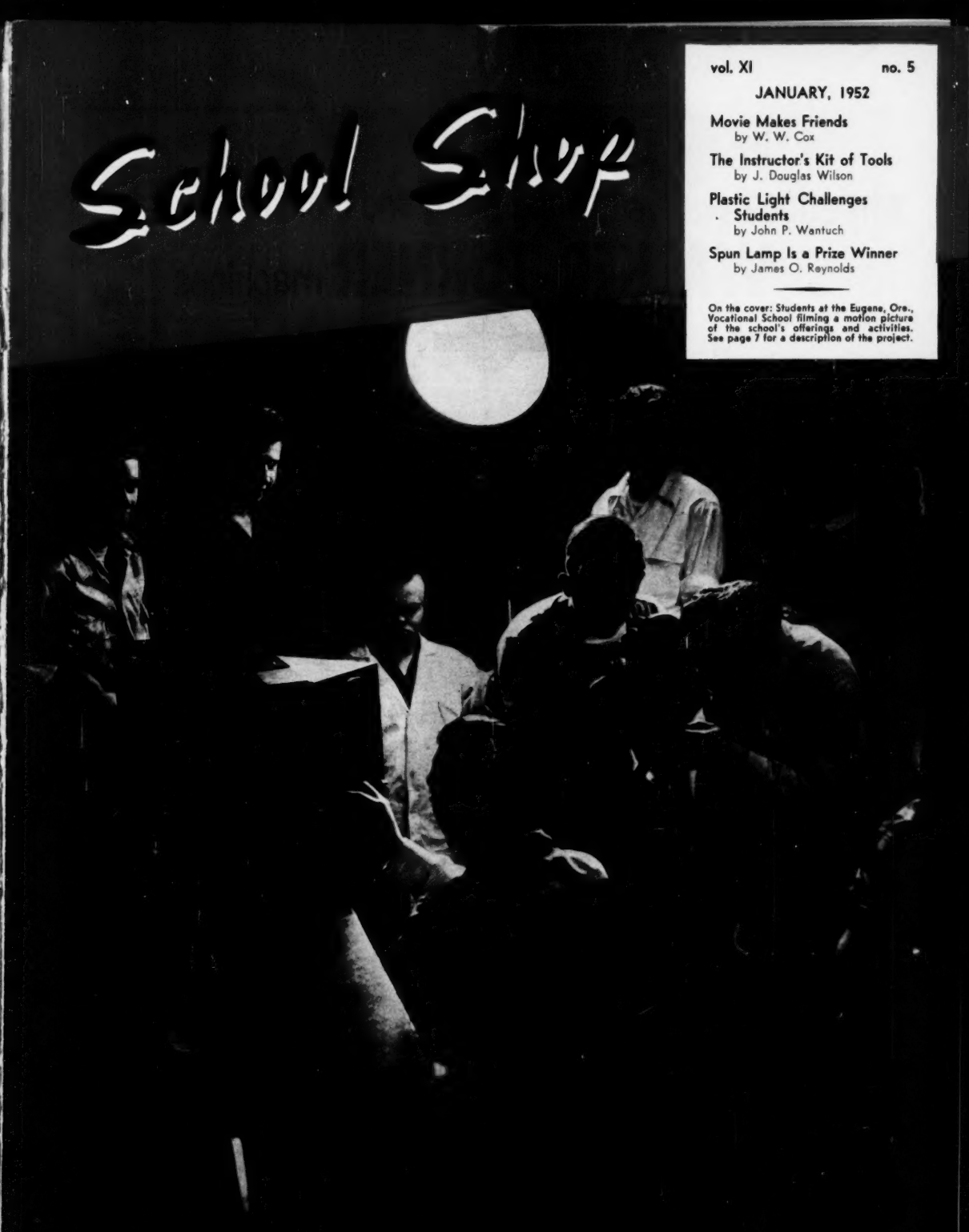
by W. W. Cox

The Instructor's Kit of Tools
by J. Douglas Wilson

Plastic Light Challenges Students
by John P. Wantuch

Spun Lamp Is a Prize Winner
by James O. Reynolds

On the cover: Students at the Eugene, Ore., Vocational School filming a motion picture of the school's offerings and activities. See page 7 for a description of the project.



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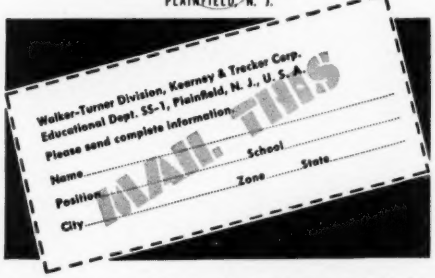

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In the Offing . . .

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School Shop

FOR INDUSTRIAL EDUCATION TEACHERS

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New Books for the New Year

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School Shop TALK

COMMENTS ON ISSUES FACING INDUSTRIAL EDUCATION

Keep the Record Straight

The one happy note in the indictment of the Vocational Division of the USOE for lax administration by the House of Representatives Government Operations Subcommittee as reported in SCHOOL SHOP's Washington letter last month was that vocational education is worthy of the financial support it is receiving. There seems to be no question about the inherent value of this important area of education in Congressional minds—for which amen!

The evidence indicates that there have been serious and numerous derelictions on the part of state and federal officials in carrying out the intent of the vocational-education acts. Explanations and reformation are definitely in order.—*L. W. P.*

The Best Is Cheapest

There are those in public office who spend public money with great prodigality. Their sole purpose appears to be to increase their budgets, not because there is a need for it, but merely so they may spend more.

On the other hand, we have public officials who are so concerned about protecting the public funds that they will sacrifice efficiency to save a few dollars.

The spendthrifts constitute a menace to society, and some means should be devised to suppress them. We shall leave them to their conscience, and to the reward to which they are entitled in the hereafter. However, many of the individuals in the miser class are to be pitied, and their attention should be directed to the fact that frequently the saving of a few dollars in an original purchase may lead to a constant drain on the public treasury.

School officials are not exempt from these categories as we find examples from both groups in many school systems.

The problem of purchasing equipment for school shops is one which appears perennially in most cities, and it becomes particularly acute when a new shop or school has to be equipped. As a rule, teachers who are confronted with the task of equipping a shop tend to favor those items with which they are familiar. This is a natural reaction, but it should be kept in mind that there are articles in the market which look exactly alike, but which are not comparable on the basis of quality.

An example of this may be found when purchasing edge tools. One wood chisel may appear to be the same as another, but one will hold its edge while the other will not.

Again, two lathes may look alike, but one has bronze bearings while the other has high-grade ball bearings. The cost of the latter may be slightly higher than the former, but there is no question of which is the better.

It is true that the purchaser may have procured two chisels for the price of one, and he may have been able to obtain another piece of equipment by sacrificing the better lathe in favor of the poorer one. But, in many cases, it would be more economical to spend a little more for the better tools, thus saving considerable grief.

There are a number of firms who supply schools with shop equipment. Most of these have established for themselves an enviable reputation, through a long period of years. Any one of these reliable firms can be depended on to advise school personnel on the relative advantages of various pieces of equipment. And so the first consideration, when the purchase of equipment is being contemplated, is not so much the dollar cost as it is that the buyer is dealing with a reliable firm.

Another point to be thought of is whether to buy locally or to give the order to a concern outside the community in which the school is located. As a rule, it is good policy to seek bids from both local and outside firms if the firms are known to be able to fill the order.

If it is found that a bid from outside is considerably lower than those submitted locally, it may be profitable to accept the one from abroad. However, if the difference is insignificant, it would still be economical to buy locally. This makes for better relations in the community, and tends to encourage local business people to support the schools at critical times when it is needed.

Above all it is usually more economical to secure the best equipment available, since it will last longer, it will give better service, and will cause less annoyance after it is installed. It is better to have less and better equipment than more which is inferior.—*T. D.*

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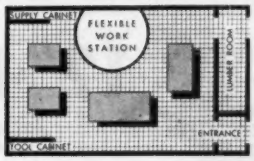
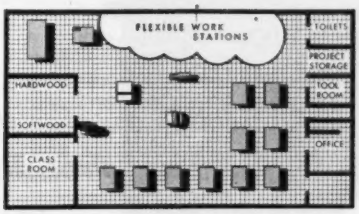
No school's too small  ...or too large  ...for Shopsmith

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Movie Makes Friends

By W. W. Cox

Using its own photography department, the Eugene, Oregon, Vocational School has filmed a motion picture that is rapidly making it friends in its area. W. W. Cox, director of the school, tells here how it was done.

OUR school has gone into the motion-picture production business —but for a very specific purpose!

The reason we took this step was to try to answer in part the problems of counseling, publicity, and promotion. We felt that prospective students would be interested in a pictorial presentation of what the Eugene Vocational School offers. Moreover, the general public was also entitled to a showing of what the school was doing and what it had to offer in adult education.

The net result was a 16mm colored motion picture which was taken by the photography department of the school and is called "Train for Tomorrow." It depicts three high-school seniors who are interested in learning a trade or occupation as they visit the Vocational School to help them decide on their vocation.

The introduction to the film shows the superintendent of the school district signing a letter which states the purpose of the film. The three students are then shown in a class of graduating seniors before they decide to visit the school. They take a tour of the school where they see the work being done in the various shops and the related instruction being given in the classroom. In the final scene they are shown as members of the student body of the school working in the department of their choice.

The Eugene Vocational School is primarily an adult training center operated by School District No. 4, Eugene, Oregon, and the State Department of Education, Division of Vocational Education. The problem of promoting day trade classes, homemaking classes, and evening trade supplementary classes is always in the foreground. Oregon is one of the fastest growing states in the Union and the Eugene area is receiving more than its share of new people. Publicity is very important in order that these new residents may be informed regarding the activities of the school.

The film shows some of the evening classes, such as upholstery, furniture refinishing, tailoring, and dressmaking, that are available for the homemaker. Scenes in the evening apprentice classes were also taken to show the school's cooperation with the apprentice program as well as the possibilities of refresher classes for journeymen in the various fields.

The primary purpose of this film, however, is to aid in the counseling of students in the junior- and senior-high schools of this area. In Eugene itself more than 20 percent of its high-school graduates go on to institutions of higher education. Many of the communities around the area are not so fortunate. One of the duties of a counselor is to know what is available to the students in job opportunities and to instruct them regarding these fields. The counselors should also know what trade training facilities are available so that a young man or woman may go to a trade school and enter a chosen field through this method. The Eugene Vocational School works with the local apprenticeship counsel on entrances into all the trades. The film seems to fill this purpose very adequately.

"Train for Tomorrow," was completely planned and filmed by the photographic department as part of the training program. Students were assigned different jobs such as cameraman, lighting man, production, and others. The instructor and students spent two weeks working out their outline or scenario and visiting the other departments as they organized the way the scenes should be taken. Twenty-one departments were photographed with some departments having several set-ups. Sixty-nine different scenes were filmed. These took four weeks of part-time work to film. The original outline listed the running time and general composition of each scene. Changes and corrections were made in the outline before filming. Still pictures were taken, in some instances, to check results before motion pictures were taken.

A total of 750′ of Type "A" Kodachrome 16mm film was used, but in the final edition the film was cut to 550′, with a running time of 25 minutes. The average running time for each department is approximately 72 seconds. A Bell and Howell Filmo 70DA camera was used. The camera was equipped with wide-angle, 1″, and 3¾″ lenses. All three lenses were used to obtain the best possible pictures of the shops and pieces of equipment.

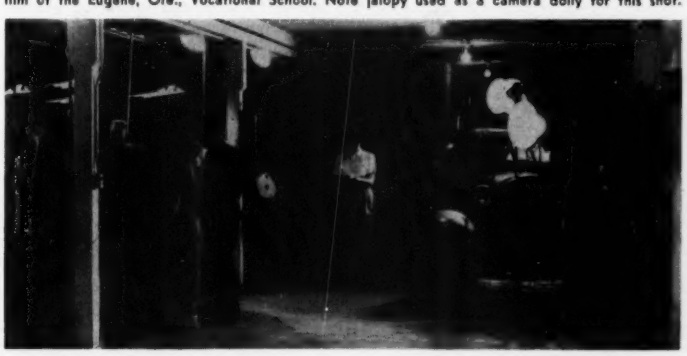
Each scene, with the exception of three outside shots, was taken with flood lighting to cut out all daylight. The lights used were three No. 4 photofloods, six No. 2 photofloods, and several spots. The lighting for each of these scenes equaled approximately 7000 watts. In many cases up to 700′ of extension cord had to be used to operate these lights.

The students shown in each department are actually enrolled in the department. A total of 136 people are shown in the film.

During the first three weeks of showing, over 1500 high-school students in this area viewed the film. A majority of these students will enter trade training, work, or college.

This film is being made available to all schools, churches, service clubs, trade unions, PTA, and others in the area who wish to use it. One college has requested the use of this film in connection with its summer-school guidance programs. All the high schools have asked that it be shown again next year which is one indication that it is fulfilling its purpose very admirably. ★

Shooting a scene in the machine shop for "Train for Tomorrow," the counseling and public-relations film of the Eugene, Ore., Vocational School. Note jalopy used as a camera dolly for this shot.



The Instructor's Kit of Tools

By J. Douglas Wilson

Certain principles, if followed by vocational teachers, can make their instruction more effective. The author presents a number of these arranged systematically for the guidance of his fellow shopmen. J. Douglas Wilson is Supervisor, Trade and Industrial Education, Vocational and Practical Arts Branch, Los Angeles, Calif., City Schools. The drawings were made by students under the direction of Arthur Starr, instructor in the art department of Los Angeles Trade-Technical Junior College.

VOCATIONAL instructors are not successful by accident. Experienced teacher-trainers have identified the factors involved in good teaching which are attainable by all vocational teachers.

What, then, are the items, techniques, and instructional materials which make up a "kit of tools" that the efficient instructor brings to his class? The successful instructor has definite information and knowledge of several distinct and clear-cut teaching methods, teaching procedures, and teaching aids. These "tools," when used at the right time and the right place in the lesson plan, will result in an excellent job of instruction. Each of these "tools" will be discussed separately with no special consideration given to the order of presentation. They can be adapted to any situation which may develop from the time a class starts until the last student has left the classroom.

I. Laws of Learning.—Thorndike lists three basic laws:

A. *The Law of Readiness.*—"To do those things we *want* to do is satisfying; *not* to do is annoying; to be *forced* to do is also annoying."

B. *The Law of Effect.*—"The individual tends to repeat and learn quickly those reactions which are accompanied or followed by a satisfying state of affairs. He tends *not* to repeat—if reactions are accompanied by an annoying state of affairs."

C. *The Law of Exercise.*—"Use or repetition of a response *strengthens* it; failure to use it *weakens* it."

The trained instructor recognizes these laws as basic to a good learning situation.

II. Individual Differences.—

A. *Physically.*—People are different—some are tall, others short; some are slim, others fat; some are white, some are dark. People do not even look alike, except in rare instances such as identical twins.

B. *Mentally.*—People are also different—some think fast, others slow, some are good in the use of numbers, others have much difficulty even with the simplest problems. Some people are skilful with their hands, others can never acquire high craftsmanship skills.

The wise instructor never forgets the basic fact of individual differences; hence never expects the same performance from each student. The student with limited abilities who applies himself and tries hard to accomplish a piece of work is to be commended above the student who has the ability, but does not try.

III. Safety Practices.—Safety underlies all good teaching where hazards are involved. The careful instructor watches and plans for safe working conditions and operations. He teaches the safe procedure *before* the student attempts to do the job.

IV. Course Outline.—A course outline indicates what the instructor expects to cover and in what sequence. It indicates to the student that the instructor knows what he is doing. In brief, a course outline is a "road map" for both instructor and student. This is a must in the teacher's kit of tools. (See Fig. 1.)

V. A Lesson Plan.—The instructor who plans his work in advance for each session knows exactly what he expects to do, what materials he needs to prepare, and the relationship of the current session to both the *previous* lesson and the *next* lesson.

Key questions should always be incorporated in a lesson plan. (See Fig. 2.) A key question will always lead into other supporting questions. A lesson plan simplifies the actual work of the instructor, and is a *must* in successful teaching. This item is probably the most important "tool" in the kit. (See Fig. 3.)

VI. Teaching Methods.—

A. These four steps are basic to all good teaching:

1. *Preparation* — of the instructor when making a lesson plan; of the student (by the instructor) to receive the new lesson material.
2. *Presentation*—(by the instructor) of the topic.
3. *Application* — (by the students). Students apply the information received.
4. *Testing*—Can the students do it without help?

B. There are several methods of presentation that the instructor should know and which must be selected in keeping with the job being taught:

1. *Group Instruction.* — Instructor

Fig. 1—A course outline is a "road map" for both instructor and student so each can reach the goal.

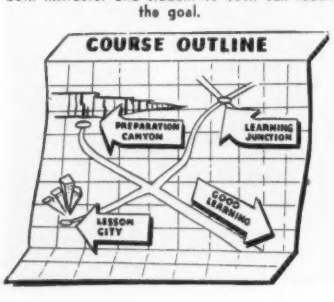


Fig. 2—Key questions should always be included in a lesson plan to unlock the door to learning.

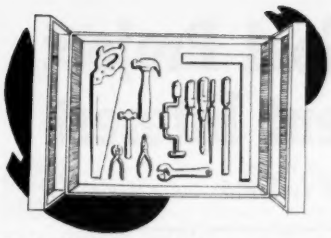


Fig. 3—The lesson plan is the most important "tool" in the instructor's collection of aids.

deals with several students at the same time.

2. *Individual Instruction.*—Instructor deals with but *one* student at a time. The best method, but the most costly.

3. *Demonstration.* — Instructor performs an actual demonstration, using the exact required tools and doing a skilful job.

4. *Conference Method.* — Instructor "draws out" information from students, assembles, rearranges, and summarizes into logical order. This is one of the best methods for creating interest and helping students think through their *own problems.*

5. *Lecture.*—Instructor "pours it on." It is one of the poorest methods of instruction, altho it must be used when the class is large.

VII. The Art of Oral Questioning[1]

This topic is in reality a phase of the preceding topic, but it is so important that a separate heading has been made to cover this "tool."

1. *Why oral questions are asked:*

a. To discover interests, abilities, and knowledge of students.

b. To arouse interest and direct attention of students to lesson.

c. To stimulate discussion and keep it on the subject.

d. To review and summarize important points.

e. To assist students in planning their work.

f. To assist students in analyzing their own problems.

g. To test student's knowledge.

h. To check effectiveness of instruction.

2. *How to ask oral questions:*

a. Instructor should use correct grammar, simple words.

b. Keep questions on the subject.

c. Keep questions in correct sequence.

d. Be sure questions are pertinent and thought-provoking.

e. Be sure questions can be answered in only one way.

f. Ask question, pause, then name the student.

g. Repeat question for clarification, not for inattention.

h. Ask questions that can be answered.

i. Insist on individual responses to questions.

j. Do not ask questions in rotation (that is, alphabetically) or by seating arrangement.

k. Ask questions with reasonable frequency.

l. Fit questions to individuals if possible.

m. Allow students to answer from their seats.

n. Encourage *all* students to participate.

o. Do not give answer clues by facial expression or voice.

p. Keep questions impersonal.

q. Verify answers given with other students to stimulate discussion.

r. At the end of a questioning period, or at the end of *any* question be sure that a conclusion has been reached.

VIII. Instructional Materials. — These may be cataloged as follows: lesson sheet materials, work and textbooks, textbooks, and visual aids: models, films, film strips, and material samples.

IX. Testing Procedures.[2]—Why are tests given? What types are there? What is the purpose of each type?

Tests are given for *two* basic reasons: To determine what the student knows and can do. To find out how well the instructional job has been done.

The instructor should carefully analyze the results of an examination to determine the reasons for student difficulties. They may be caused by lack of application on the part of the pupil, or by ineffective teaching.

Instructors should be fully informed of the kinds or types of tests and questions and the advantages and disadvantages of each.

A. *Oral test.*—Student answers an oral question put to him by the instructor. Oral questions should be carefully prepared in advance. They are excellent for a "spot check" on any topic under discussion.

B. *Written tests.*—Students solve or answer written questions presented to them. There are a number of different types of written questions as follows:

1. ESSAY. — Student formulates and writes down his own answers. This type of test is quite subjective and cannot be uniformly evaluated.

2. OBJECTIVE.—This type is easily answered and scored; students' writing ability is reduced to a minimum.

a. *Multiple-choice.* — Student selects one correct answer from a list of four or more statements.

b. *True-false.*—Student has only two choices and marks statement either true or false.

c. *Matching.*—Pictures are matched with words or vice versa.

d. *Rearrangement.* — Procedure steps for doing a job are given, but not in the correct order. Student rearranges items to conform to trade practice.

e. *Recall.*—Really a memory test as the answer is a factual one.

f. *Completion.*—One or two words are omitted from a sentence; student supplies the missing words.

g. *Problem.*—Questions are usually solved mathematically.

X. Progress Charts

What has the student accomplished?

(*Continued on page* 14)

[1]Based on Estabrooke and Karch, *150 Teaching Techniques.* Milwaukee, Wis.: Bruce Pub. Co., p. 66.

[2]For a detailed description of tests and testing procedures see Estabrooke, Edward C., *How to Make and Use Objective Tests.* Washington, D.C., National Home Study Council.

Fig. 4—The craftsman usually deals with things while the teacher deals with human beings. The challenge comes from the fact that the teacher's job is to make himself helpful and useful to his pupils.

Basketball Goal Project Whets Student Interest

By Clifford L. Sims

Students "go" for this basketball goal which can be made readily in the metal shop. Clifford L. Sims teaches at Northeast High School, Kansas City, Missouri.

Ford Motor Co. Photo

Mild steel is used in making this sturdy goal which every boy wants at home on the garage.

THE basketball goal described in this article was developed in the general metals shop in the junior-high school where the author formerly taught. It came about due to the natural urge of boys to want to "shoot baskets."

Many boys who were enrolled in the metal shop often expressed the wish to make a basketball goal. Owing to the limited facilities in the junior-high shop, we hesitated to undertake it. Some persisted and the results were not always something to brag about, so we decided to develop one using standard dimensions taken from a regulation goal.

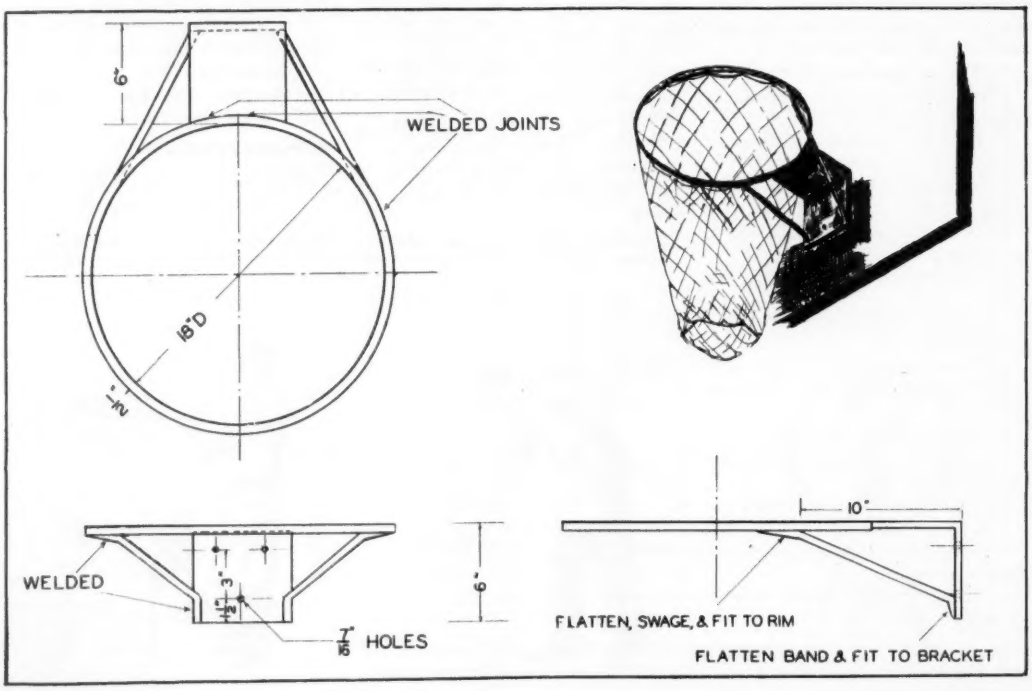
In the junior-high shop our goal was assembled with rivets as we had no welding equipment. After moving over to the senior-high shop a few years ago, we welded the joints. This was another improvement as it added more rigidity. The past year, one of our boys, Elvin Dalton, decided to enter his finished goal in the Industrial Arts Awards contest where it won an honorable mention.

The bracket, ring, and braces may be made from either hot or cold rolled metal. The bracket has a 90° bend in the center of the piece and the end that joins to the ring should be ground or cut out with a torch to fit the curvature of the ring.

The ring may be formed any of several ways, depending on the equipment in the shop. If only an anvil and hammers are available, it can be formed cold, using a crosspein hammer and striking the inside of the ring over the space between the rod and the step down from the face and the unhardened flat surface of the anvil.

The flattening, swaging, and fitting of the braces to the bracket and the lower edge of the ring also gives some good forge practice. The ring should be welded to the bracket before the braces are fitted.

The bracket is made from a piece of $\frac{3}{8}$" x 6" x 12" mild steel. The ring is constructed of $\frac{1}{2}$" x 56" round mild steel while the braces are made from two pieces of $\frac{1}{2}$" x 13" round mild steel. ★



Plastic Light Challenges Students

By John P. Wantuch

THIS television or night light is a practical project which finds a ready welcome in the home. Students who have had some experience in working with plastics will find this a more challenging project than the usual beginning ones as the internal carving requires some skill. The introduction of the light offers an opportunity to correlate the work with that in electricity.

The elements of good design plus the challenge of the skill required for internal carving make this an intriguing project. It won an honorable mention in the Ford Industrial Arts Awards for its maker, Elmer Johnson. John P. Wantuch teaches at the Chicago, Ill., Vocational School.

Ford Motor Photo

Simplicity is the key to the attractiveness of this light which won a prize for its maker.

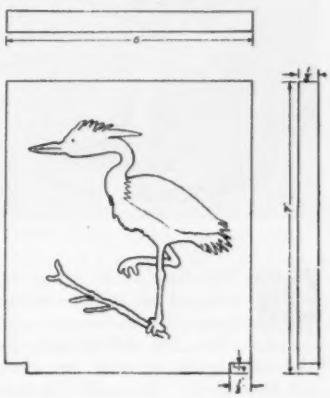
The design may be varied to suit the individual. Fowl, fish, or floral designs work out best, but a full-size outline is necessary for best results.

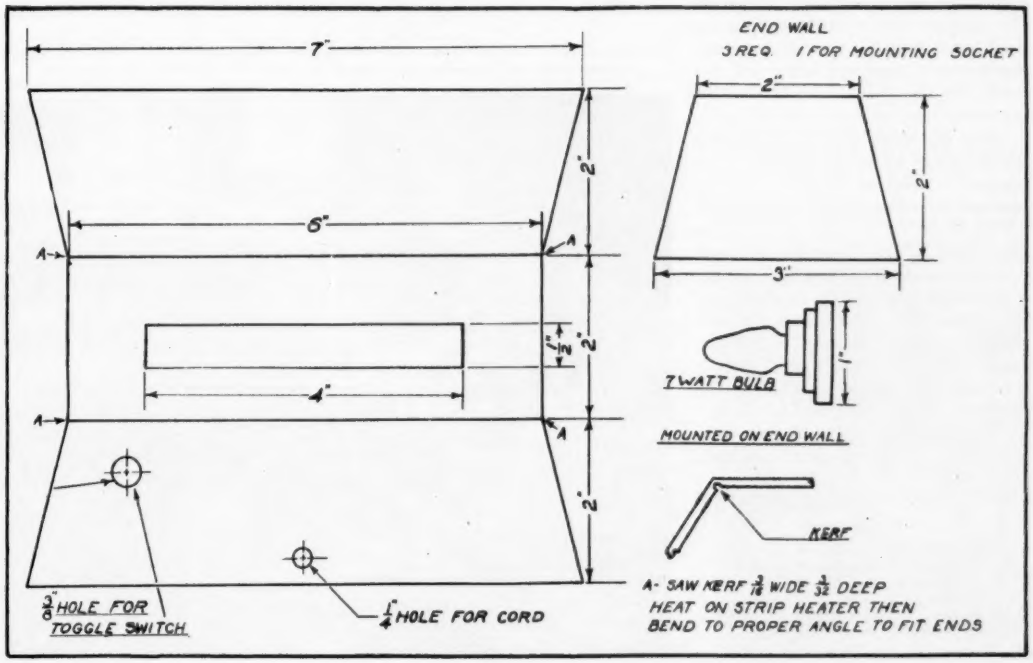
To surface carve the blue heron pictured here, procure a piece of ½" x 6" x 7" clear acrylic stock, remove masking tape from both sides, and place plastic over the outline. Scotch tape may be employed to secure drawing to plastic.

With the aid of a small rotary tool and a No. 624 finishing burr, outline the body. (Not recommended for the beak.) Follow up with a No. 4931 to remove most of the body. (Use sideways.) Legs may be burred with a No. 6210 cutter-head. Wing and tail feathers are cut in with a No. 4-B70 mounted wheel. (Watch angle.) The beak may be cut in with this same cutter.

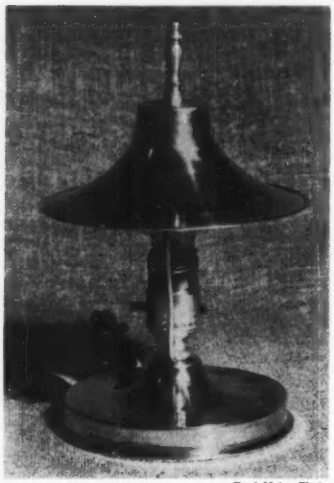
The bottom of the plastic may be notched out to fit the opening in the lighted base. The bottom edge of the plastic is coated with blue laminating cement or the usual airplane dope sold in hobby shops.

(*Continued on page* 14)





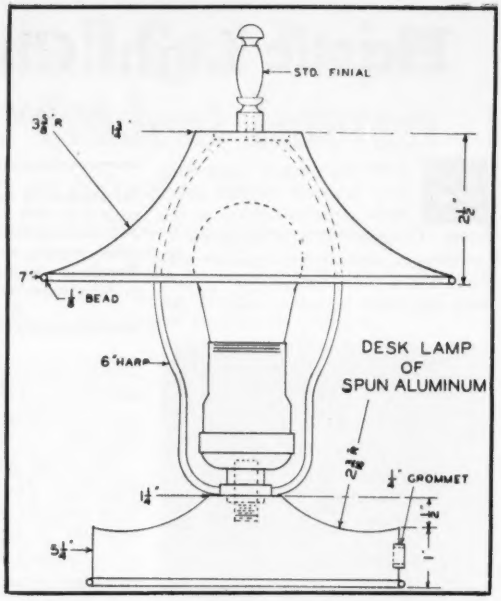
Spun Lamp Is a Prize Winner



Ford Motor Photo

By James O. Reynolds

This spun aluminum lamp was a prize winner for its maker, Gary Dancer, in the Ford Industrial Arts Awards. Gary's teacher at the McKinley Occupational School, Dayton, Ohio, is James O. Reynolds who carries on an extensive program of metal spinning.



TESTED 55 PROJECT

THE lamp as illustrated was designed as an intermediate project for students of metal spinning. It is not difficult after the fundamentals of spinning have been well established. Three different techniques are introduced to the student in this project: corner beading, spinning back, and spinning around an acute-angle edge. Aluminum works well and easily for the student who tackles this problem.

After the chucks have been made, the shade should be spun first since it is simpler. Standard spinning practice will suffice to bring the shape to the edge of the chuck. Carefully trim the edge and allow ⅜" overhang for the bead. Use the wedge-shape backstick to support the back side of the overhang and the half-round tool to start the roll. Bring it around until it is of sufficient angle to fit the beading tool. Carefully trim again and complete bead with beading tool.

The base chuck which will have to be spun more carefully involves spin back. If the student will work in small radii while spinning the disc down on the chuck, little trouble will be experienced. On reaching the edge of the chuck the metal will have a tendency to turn back. Here the backstick is used again and the metal worked to an angle of approximately 45°, after which the backstick is removed and the metal spun down tight on the form. Again allow ⅜" overhang for the bead which this time is laid down in conventional manner.

Assemble the lamp according to the illustration. The maximum size bulb that this lamp will accommodate is 25w. The harp may be of the rigid or swivel type and for *safety's sake* don't forget the grommet! ★

Bill of Material

1—20 gage aluminum disc, 9" d.
1—20 gage aluminum disc, 7" d.
1", ⅛" threaded pipe with locknut.
1—6" harp with finish.
1—aluminum socket with push-pull switch.
1—¼" rubber or plastic grommet.

Gary Dancer performing one of the more difficult spinning operations on the lamp while a fellow student assists him by holding the backstick to support the backside of the overhang.

McKinley School Photo. W. K. Groff, Instructor

Pyrometer Project Has Many Uses

By Anthony Peranio

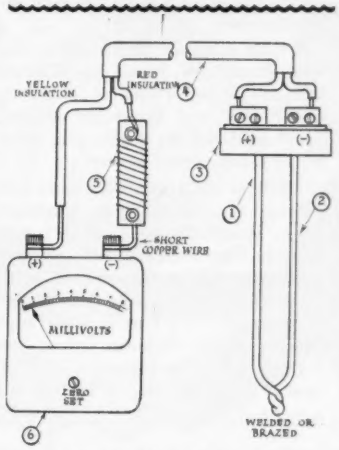
This project will give the student an understanding of thermoelectric principles as applied to temperature measurement using a thermocouple and millivoltmeter. Anthony Peranio teaches the course in Industrial Instruments at the New York State Institute of Applied Arts & Sciences at Buffalo.

THIS thermocouple-millivoltmeter pyrometer was constructed and used to determine the temperature of a salt-tempering bath in the Instrument Laboratory. An instrument of this type could be used to determine the block or exhaust temperature of an automotive engine. Or, it could be used to measure temperatures of oil, water, or other liquids in a variety of applications. It can be used in place of the conventional liquid-in-glass thermometer, and has the added advantages that it is remote reading and can be used at high temperatures.

The instrument consists of three parts: the thermocouple (with its extension leads and terminal block), the millivoltmeter, and a series resistance.

1. **Thermocouple.**—If two lengths of wire composed of dissimilar metals are joined at one end (the hot junction) and heated at this end, an electromotive force (emf) will be produced. This electromotive force can be measured at the other end (the cold junction) with a millivoltmeter. The reading obtained at the millivoltmeter is a function of the temperature difference between the hot and cold junction, the type of metals used in the thermocouple, and the electrical resistance of the meter and remainder of the circuit. This circuit is a simple series circuit composed of a seat of emf (the thermocouple), resistance of the thermocouple, leads, series resistor, and the meter resistance. The diagram shows the nature of this circuit.

2. **Millivoltmeter.**—The millivoltmeter chosen depends on the temperature range to be covered. The maximum temperature to be measured should be a multiple power of ten of the full scale reading of the millivoltmeter. At the same time, however, the full scale millivoltage should not exceed the millivoltage output of the thermocouple at the maximum temperature. For example, a 5 mv meter could be used to measure 500°F; a 10 mv meter for 1000°F; a 20 mv meter for 2000°F. However, it is not possible to use a 50 mv meter to measure 500°F because at this temperature the output of a chromel-alumel thermocouple is only 10.56 mv. This mv output would be insufficient to obtain full scale deflection.



1. No. 8 B&S gage chromel wire.
2. No. 8 B&S gage alumel wire.
3. Thermocouple terminal block.
4. Thermocouple extension lead wire (No. 14 B&S).
5. Series resistor.
6. Millivoltmeter.

3. **Series Resistor.**—Since the relationship between the emf output of a chromel-alumel thermocouple and temperature is linear for all practical purposes, it is possible to calculate the value of a series resistance so that the temperature of the hot junction will be indicated by the meter reading multiplied by a power of ten. Unless the proper series resistance is calculated, the temperature cannot be obtained simply from the meter reading.

The parts used in the construction of this pyrometer are:

A. A 0-8 mv meter of approximately 13 ohms resistance, 3½" panel meter, Type RX-35, #1159573, flush mounting. Cost: $18.00.

B. A 12" chromel-alumel thermocouple and terminal block, #8 B&S gage wire. Cost: $4.40, The Bristol Co., Catalog #Y50W8 & YTB.

C. 6' of duplex thermocouple extension leadwire, asbestos covered. Cost: $1.08, The Bristol Co., #85948.

D. A hand-wound series resistor of 15.8 ohms. This was made from resistance wire wound on a bakelite form having two bolt-and-nut terminals for connecting in the circuit. One suitable type of wire is chromel "A" resistance wire #30 gage, resistance 6.50 ohms/ft. Cost: $.025, for 25 feet, Eimer & Amend (Fisher Scientific) #15-540.

It is of utmost importance that the series resistor be of correct value. If the series resistance is not properly determined, the temperature reading obtained will be in error. Using Ohm's Law to analyze the series circuit of this pyrometer, it is found that the expression for determining the value of the series resistor is:

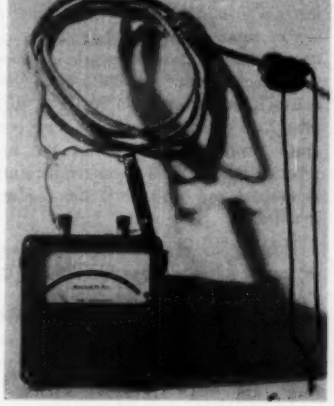
$$R_s = R_m\left(\frac{E_{tc}}{E_{ts} - E_c} - 1\right) - \left(R_L + R_{tc}\right)$$

R_s = series resistor value, ohms
R_m = meter resistance, ohms
E_{tc} = millivolt output of the chromel-alumel

(*Continued on page* 14)

Student at New York State Institute of Applied Arts & Sciences using the MV meter pyrometer.

Note series resistor connected to terminal of millivoltmeter and chromel-alumel thermocouple.



Pyrometer . . . *from page 13*

thermocouple at the maximum temperature to be measured, corresponding to the full scale deflection of the meter. Tables of E_{tc} are published by most of the large instrument companies such as Bristol, Wheelco, Brown, and Taylor. See also, *Industrial Instrumentation* by D. P. Eckman, Wiley, 1950.

E_{ts} = full scale millivolt reading of the meter. E_c = millivolts corresponding to 32°F (or 75°F). This is usually either 0.32 mv, or 0.75 mv, depending on whether E_{ts} is obtained from a thermocouple table whose cold junction is based on 32°F, or 75°F.

R_L = resistance of the extension lead wire, ohms.

R_{tc} = resistance of the thermocouple wires, ohms.

For this case, R_m = 13.0 ohms, E_{tc} = 16.57 mv (this is for a hot junction at 800°F and a cold junction based on 75°F), E_{ts} = 8.00 mv, and E_c = 0.75 mv.

In order to determine R_{tc} and R_L, the best procedure is to connect them together, and use a Wheatstone bridge to determine their combined resistance. However, it is possible to estimate this resistance closely by using the wire resistance data supplied by the manufacturer. A #8 chromel wire has a resistance at 70°F. of 0.026 ohms/ft.; #8 alumel wire, 0.0107 ohms/ft.; chromel-alumel duplex lead wire, #14, 0.147 ohms per ft. Thus R_{tc}=0.037 ohms, and the 6′ leads have a resistance of 0.882. Or, $R_{tc}+R_L$=0.92 ohms.

Substituting all these values in the expression given, R_s is found to be 15.8 ohms.

Operation—Connect the parts of the pyrometer as shown in the diagram. Before using the instrument, it is necessary to make the cold junction temperature compensation adjustment. This is done by using a small screwdriver to turn the zero set screw on the millivoltmeter so that the meter pointer will indicate room temperature.

If this adjustment is not made, the meter will indicate a temperature that is low by an amount just equal to the room temperature. For average work (or when the exact room temperature is not known), the pointer can be set to 0.75 mv (75°F). Then, to obtain a temperature reading, merely insert the hot junction into the fluid whose temperature is desired and wait until the reading steadies.

This project has been met with interest and enthusiasm by all students assigned to it. It shows the application of Ohm's Law to a typical thermoelectric circuit and gives the student experience in electrical and temperature measurement. ★

Marshall L. Byrn Passes

Marshall L. Byrn

Marshall L. Bryn, 64, Assistant Professor of Vocational Education and Head, Industrial-Arts Department, University High School, University of Michigan, Ann Arbor, died November 23 after an extended illness. He was Consulting Editor for SCHOOL SHOP for the past ten years.

Known as master teacher and a master craftsman, Mr. Bryn's infectious enthusiasm for both young people and superior skill and knowledge inspired many industrial-arts teachers in training to become better teachers.

Mr. Byrn was a member of many professional societies and spoke frequently before groups of teachers. He was particularly adept at giving demonstrations in such areas as metal spinning, silversmithing, and aviation. He was a teacher of automechanics at Cass Technical High School, Detroit, Michigan, before joining the staff of the University of Michigan in 1924. Surviving are his wife and a son and daughter.

Plastic Light . . . *from page 11*

When mounted and lit the blue will tint the outline of the blue heron making an interesting and unusual picture.

The remaining three edges may be sanded and polished. A slight chamfer around the back side of these three edges will give the appearance of framing the carving. The base may be made of either ⅛″ or 3/16″ black opaque acrylic stock.

Cut stock to shape shown, then cut kerfs to help in making straight-line bends. Heat from a strip heater is sufficient to soften material for this bend. Ends are cemented in place after a fine right-angle sanding. Brush on laminating cement last.

A series of ½″ holes can be drilled in the stand and filed to form ½″ x 4″ slot. Mount socket on other end piece with screws. Coat edges with laminating cement and mount in position so light bulb will be in the middle of slot. A toggle switch is mounted inside. Commercial light bases are available today, so there is no need for making one unless experience is desired. ★

Kit of Tools . . . *from page 9*

What is his next step? What *kind* of work is he doing—excellent, good, fair, poor? These are items recorded on the progress chart. A training program outline shows the student where he is *going;* a progress chart shows where he has *been.*

A progress chart is also a very valuable "motivation tool." It simplifies an instructor's job, makes his work more efficient and gives the student an opportunity to check his own progress.

XI. Personality and Human Relationships

How does the instructor get along with his students? his fellow teachers? his administrators? Is he quick and abrupt, patient or impatient? Is he enthusiastic or passive about his work?

Satisfactory human relationships, which are carefully watched and nurtured, will do much to smooth out the path of the instructor in the classroom and with school administrators.

XII. The Instructor's Kit of Tools

An examination of the "tools" described above reveals the following "kit."

1. An effective instructor has a *knowledge* of: the laws of learning, individual differences of his students, safety practices, teaching methods, the art of asking questions, necessary instructional materials, test procedures, and personality and human relationships.

2. An effective instructor *possesses:* A course outline or a training program and a progress chart of his teaching program.

3. An effective instructor *knows how* to prepare a daily lesson plan.

XIII. Summary

The quality of today's teaching will be reflected in the skills, attitudes, and habits of the people of tomorrow. The craftsman usually deals with things. *The teacher deals with human beings.* (See Fig. 4.) The craftsman's job is to make something useful. *The teacher's job is to make himself useful to his students.*

What a responsibility! What an opportunity! ★

AVA Convention

NEW president of the American Vocational Association is Harry C. Schmid of Minnesota. For a convention report, see page 20 of this issue.

TEACHERS... How would you like to win Nationwide Recognition in 1952?

Henry Ford II congratulates Fred A. Marcellus of Hanford Union High School, Hanford, Calif. One of Mr. Marcellus' students was a 1951 Outstanding Achievement Award Winner.

More and more teachers each year take part in this nationally recognized program... and for 1952 I.A.A. offers you and your students more awards than ever!

Ford's Industrial Arts Awards program has become a national symbol of outstanding achievement . . . thanks to the enthusiastic support of industrial arts and vocational teachers. That's why Ford is pleased to announce that the number of awards for teachers in the 1952 program has been increased from nine to thirty. Teachers, whose students win Outstanding Achievement Awards, will be invited for a 3-day all-expense visit to Detroit and the famous Ford plant at River Rouge. At the Celebration Dinner they will receive special achievement awards.

Now is the time to get your students started! Boys and girls, grades 7 through 12, are eligible to enter. The project must be made in school . . . and under supervision of a vocational or industrial arts instructor. Last year 2400 students participated, representing 493 schools all over the country!

Leading industrialists and top-flight vocational educators will be selected as judges. The 1952 program offers over 1000 prizes, with a cash value totaling more than $40,000! Entries will be classified according to grade level, so that students will have equal opportunity to win. Industrial Arts Awards is an educationally sound program . . . whole-heartedly American . . . and bigger today than ever!

If your school has not already received full information, write to:

INDUSTRIAL ARTS AWARDS • FORD MOTOR COMPANY

2923 Schaefer Road, Dearborn, Michigan

Diamond Dust

Abrasive comments from that doughty Scot, Tom Diamond, former head, Department of Vocational Education, University of Michigan, Ann Arbor.

Go to the Ant Thou Sluggard

As a result of the interest of one of our more thoughtful readers it has been brought to our attention that we have failed to include in our biological research the habits of the common or garden variety of ant.

While it is not our intention to heap unearned honor on the critter, it should be said that he has been accepted by many as the emblem of industry. However, some students of his activities have come to believe that his unbounded energy does not necessarily result in great achievement, when viewed from the standpoint of human values.

Have you ever watched a colony of ants at work? It is one of the wonders of the world. Their reconnaissance staff can spot a morsel of food or the cadaver of a comrade vast distances from their nest, and almost immediately a detail is on the job to transport it to the community storehouse or to a place of interment. Others build bridges, bore a maze of subterranean pasages, and overcome apparently unsurmountable obstacles, all to the end that the succeeding generation may live to continue the process.

They have been classed as social insects, but when one begins to meddle in the affairs of others he is apt to become a pest. The ant is a great explorer and, in his travels, he wanders into his neighbor's yard and plays merry heck with everything that comes in his path. He wrecks the timbers of the house, he meanders playfully over food, and disports himself generally in the kitchen in such numbers that it distresses friend wife. When this happens family life is upset, and life becomes unpleasant. One need only experience this once to convince him that Mr. Ant is one of the most unsocial beings known to man.

But, you ask, what has all this got to do with industrial arts? While the relationship may be somewhat obscure to some, if they have been observant they could not fail to note the similarity between the activities of the ant and those of some teachers.

Have you ever noticed the teacher who is constantly in motion, at high speed. He jumps from one pupil to another, he chases from one corner of the room to another, and he flies to his desk, to the stockroom, to the toolroom, or to the supply cabinet, merely to do for the pupils what they should be doing for themselves. He is so busy that he is unable to pause long enough to greet the chance visitors who enters his shop. He is afraid that if he is not—what he terms—on the job, all activity will cease. And the probability is that it would, since the pupils have become so accustomed to having things done for them that they have had no opportunity to develop their initiative.

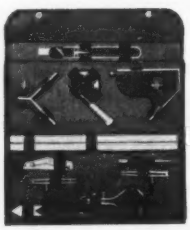
There is lots of activity going on, bushels of it. However, if you can stop the teacher long enough to inquire what he is aiming at he is apt to announce that it is his responsibility to keep the boys busy. He has no course of study, or, if he happens to have one, he has no time to dig it out of the debris on his desk. This teacher displays great activity, oodles of it, but it is scarcely what one would term purposeful. Like the ant, he covers a great deal of ground, but what he does contributes little to human development.

Then there is the teacher who is less vigorous than the one mentioned above. He is static, but he is busy. He stands

Easy to BUY ISSUE STORE

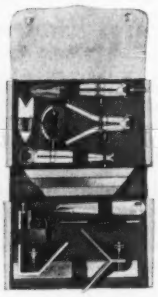
Starrett sets of tools contain all the measuring tools your boys need for most shop projects, selected on the basis of long experience with vocational education needs. These compact, convenient kits are easy to store and issue, protect the tools, prevent loss or damage. Best of all, they are priced to fit the slimmest budget. See them at your Starrett Tool distributor's. Write for Educational Folder No. 1202. Address Dept. SS.

Starrett SETS OF TOOLS



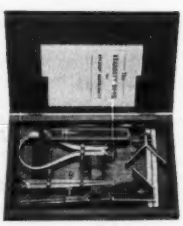
SET NO. 902B

A more complete set for students and apprentices. Contains a 1" micrometer, 12" combination square with center head, center gage, center punch, 6" flexible steel rule in case, 4" divider, 4" inside caliper, 4" outside caliper and 4" hermaphrodite caliper. Simulated leather folding case.



SET NO. 900

The basic tools at minimum cost. Contains 6" combination square complete, 6" flexible steel rule, center gage, center punch, 4" divider, 4" inside caliper, 4" outside caliper and 4" hermaphrodite caliper. Simulated leather folding case.



SET NO. 901

A practical, economical "package"—contains 6" combination square complete, 6" flexible steel rule in leather case, center gage, center punch, 5" divider, 6" outside caliper and 6" inside caliper plus The Starrett Book for Student Machinists—all in a sturdy, compact, nicely finished wood case.

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at a strategic point in the room and assumes the role of a human encyclopedia. Like the ants there is a constant stream of pupils coming to or departing from his pedestal. They want to know what size screw to use, what shall I do next, how long should this piece be, or where can I find this or that. To his credit be it said that he supplies all the answers, but he is depriving the pupils of an opportunity to become independent workers. They have learned where they can find the answers, so they become indolent and make no effort to consult their text or reference books. In short, they cease to do any thinking about what they should do or why they should do it. Here again we have much activity, but the real value of the work being done is lost.

It is not our wish that teachers ignore the industry of the ant. It is hoped, however, that they will be purposefully busy to the end that their pupils may develop initiative, that they may acquire habits of research, and that they may discover that there can be joy in work as well as pride in craftsmanship.

All teachers are busy. No one who has the responsibility for a group of young people can be otherwise. However the point to be made here is that the mere act of moving around, however rapidly, does not necessarily indicate that worthwhile things are being done. To be purposefully busy, one must have his objective clearly in mind. When this has been determined, each move should lead directly toward that objective. Moreover, whatever moves are made should be planned. This means organization, and if the teacher organizes his department effectively he can eliminate a great deal of waste motion. Added to this he will find that, as his organization functions, he will have time to observe the reactions of his pupils, and he will have opportunities to assay the results of his teaching as well as to make plans for the future.

Take Note of the Ant Thou Sluggard; Consider His Ways and *Get Wise.*

A Happy New Year and Many Thanks to Our Friends

SCHOOL SHOP extends best wishes for a happy and profitable New Year to its readers and thanks the many hundreds who stopped by our booth at the AVA Convention in Minneapolis to tell us how much they like the magazine.

The best thanks we can receive is your mention of SCHOOL SHOP when ordering from our advertisers.

Strictly Personal
ABOUT YOUR FELLOW TEACHERS

G. WESLEY KETCHAM, supervisor of industrial arts, Connecticut State Department of Education, Hartford, has been granted a year's leave of absence to be educational director of the northeastern states for the National Association of Manufacturers. KENNETH H. LUNDY is serving as acting supervisor of industrial arts during Mr. Ketcham's absence.

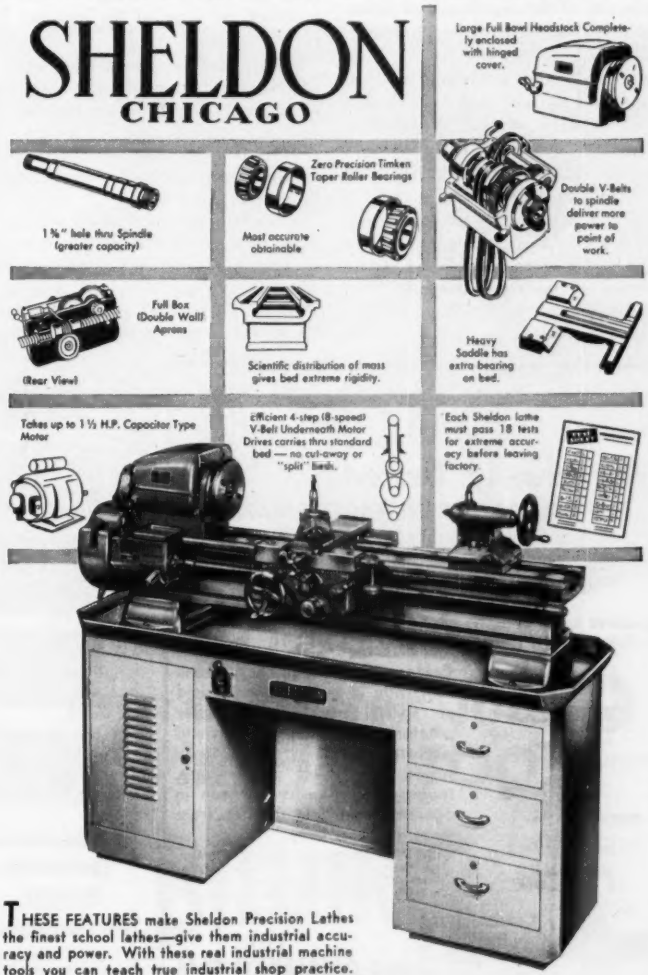
JOSEPH WOLBER has been named principal of Cass Technical High School, Detroit, Mich., replacing WILLIAM E. STIRTON, who has been appointed assistant to the president of Wayne University, Detroit.

MARION E. MADDOX has been named industrial teacher-trainer at the University of Arkansas.

New president of the Wisconsin Industrial-Arts Association is H. A. PEDERSON, director of industrial arts, Wisconsin State College, Platteville.

(Please turn the page)

SHELDON
CHICAGO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Write for Bulletin describing the new "C" Series lathes designed for schools where space or budgets are restricted.

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O. M. MERRIMAN has retired as director of vocational education, Whiting, Ind., schools.

EARL HARRIS, woodworking teacher at Armstrong High School, Richmond, Va., has retired.

B. A. KNIGHT has retired as head of the industrial-arts department, Washington High School, Indianapolis, Ind.

New members of the Evanston, Ill., Township High School industrial-arts department are STANLEY GLOW, formerly of Michigan State Normal College, Ypsilanti, and CARL GASSEN, formerly of Stout Institute.

WILLARD A. ALLEN of the State Teachers College, Oswego, N.Y., has joined the faculty of the department of industrial arts, Ball State College, Muncie, Ind.

ARCHIE BRYANT of Gadsden, Ala., has been named assistant state supervisor of industrial education for North Carolina.

DALE F. GRIFFIN has retired as vice-principal of Arsenal Technical High School, Indianapolis, Ind.

HOBART H. SOMMERS, assistant superintendent of Chicago schools in charge of vocational education, has been elected secretary of the Department of Vocational Education of the National Education Association.

News

HAPPENINGS IN INDUSTRIAL EDUCATION

Industrial-Arts Conference

MEETING in Chicago November 8-10, the Mississippi Valley Industrial-Arts Conference held its annual session under the chairmanship of Verne C. Frylund, president of Stout Institute. While no formal action was taken on any problem, as this is not the purpose of the group, which is made up of teacher-trainers exclusively, the general viewpoint on issues now facing the field as expressed by some of the members is as follows:

The feeling was stated quite generally that in the near future it will be necessary for industrial-arts teachers to have a master's degree.

There is need for greater cooperation between the national associations in the field of industrial arts.

Some felt that the research work being done in the field would be improved if there were greater participation on the part of the shop teacher and that there should be more experimental and fewer survey and questionnaire studies.

More emphasis should be placed on industrial arts in the elementary grades with elementary teachers securing a minor in industrial arts for this purpose.

Pennsylvania Conference

THE Seventeenth Annual Pennsylvania Industrial-Arts Conference will be held at the State Teachers College, Cheyney, on April 18-19. Gordon O. Wilber of the Oswego, N.Y., State Teachers College will address the closing session.

Britons Laud U. S.

A GROUP of 12 British experts on industrial education who visited a number of vocational schools and training programs in this country have issued a report in Britain in which they credit the efficiency of our industrial production to the fact that "many, perhaps most, of the best pupils from the high schools enter industry," whereas in the United Kingdom "most of our best pupils enter the professions."

The teaching methods of American schools "are in accordance with the American faith in individualism—the material is there if you want it; how you progress depends on yourself," the report says. It is also mentioned, however, "that for good average results two

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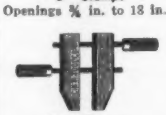

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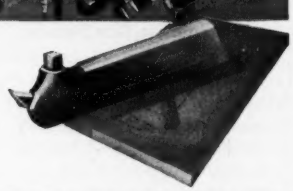

Write for Catalog

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New York, San Francisco

essential prerequisites are skillful supervision and hard work by the individual pupil. These conditions did not always seem to be fulfilled."

The group visited the U. S. under the technical assistance program of the Economic Cooperation Administration (Point Four Program).

Piqua Dedicates Building

A NEW building housing shop and music facilities for the Piqua, Ohio, High School was dedicated on November 20. Costing over a third of a million dollars with equipment equalling this figure, the new facilities will enable the high school to carry on an enlarged program in industrial education.

California Group Active

THE California Industrial Education Association is carrying on an extensive organizational program this year with emphasis placed on aiding in the work of local chapters through formal chartering procedures, the issuance of a handbook, compiling a history, and holding training sessions for local chapter officers. The annual convention will be held October 4-5 in Oakland.

Stout Fraternity Initiates

TWENTY-ONE new members were initiated into Theta Chapter, Epsilon Pi Tau, at Stout Institute, Menomonie, Wis., on October 6. Ray Wigen, director of graduate studies, addressed the group at the banquet following the initiation ceremonies.

Missouri Group Elects

NEW officers of the Missouri Industrial Education Association are president, Otho L. Barnett, head, industrial-arts department, Northeast Missouri State Teachers College, Kirksville; and vice-president, Alfred L. Mach, Hadley Technical High School, St. Louis. The association has over 500 members.

IN THE Morning Mail . .

Brief comments about SCHOOL SHOP and the field it serves are invited. Address the Editor, SCHOOL SHOP, Ann Arbor, Michigan.

Gentlemen,

. . . I have enjoyed SCHOOL SHOP since its beginning. Its editorials, articles, problems, and advertisements have always been inspiring to me as a teacher and supervisor of industrial arts.

We will forward you our new list of instructors immediately on its completion.

A. E. Anderson
Director of Industrial Arts,
Salt Lake City, Utah

(EDITOR'S NOTE: City and state supervisors are urged to send to our Circulation Department their roster of teachers so that all may receive the magazine. Be sure to include school address and specific subject taught, i.e., woodworking, drawing, etc.)

Gentlemen,

I enjoyed your SCHOOL SHOP last year very much as it is most useful. Received the new issue yesterday and thanks for such helpful material. I am looking forward to future issues.

A. J. Ostergaard
Public Schools,
Bingham, Neb.

Gentlemen,

I appreciate your magazine and feel that it is of great assistance to me in my shop. Thank you for your continued help.

Morton Taylor
Junior High School 120,
New York City, N. Y.

Gentlemen,

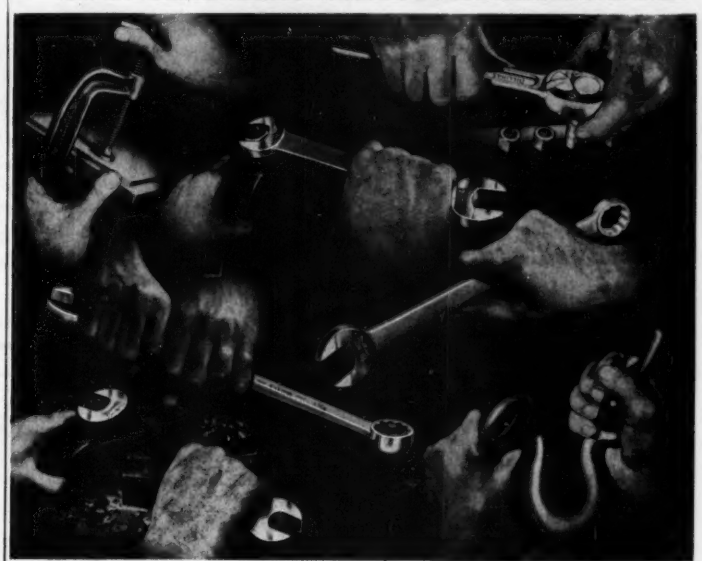
Please put me on the mailing list to receive the wonderful magazine, SCHOOL SHOP. This publication is one of the best in the field. I could use many of the ideas and suggestions offered in my teaching duties. . . .

Alton E. Auchenbach
Thaddeus Stevens Trade School,
Lancaster, Pa.

Gentlemen,

. . . Best wishes for the continued success of your fine efforts. You are doing a splendid work with SCHOOL SHOP.

LeRoy A. Blaser
Supervisor, Industrial Training Service, California State Department of Education,
Sacramento, Calif.



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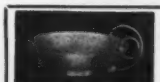

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AVA Meets at Minneapolis

MUCH of the lobby talk at the 45th Annual Convention of the American Vocational Association November 26 to 30 at Minneapolis, Minnesota, centered around the criticism of the Vocational Division of the U.S. Office of Education contained in the Congressional Hardy Report.

Earl J. McGrath, U. S. Commissioner of Education, promised a "tightening up" by the USOE in a talk before the National Association of State Directors of Vocational Education but warned that the USOE has no intention of "moving in on the states." He stated that $27,000 of the $35,000 allotted for travel in the Vocational Division will be used for reviewing programs in the states, but that more money will have to be appropriated "to do extensive traveling of this kind."

No formal action was taken by the delegates on the Hardy committee report which seriously questioned the laxness of the Vocational Division in checking the states in complying with the letter of the Smith-Hughes and George-Barden laws.

The convention was the largest in the history of the association with over 3500 persons registered and with the largest commercial exhibit ever held. The Ship's Citation was awarded to Dean Clyde A. Bowman of The Stout Institute, Menomonie, Wisconsin. This is an annual award by The Ship, a social organization of firms in the field of vocational education, to outstanding leaders and takes the form of a suitably engraved watch and a framed tribute.

The convention delegates voted to increase the dues to the AVA from $2 to $3 for affiliated memberships and from $3 to $4 for direct memberships after the necessity for increased revenues to meet rising costs was explained to the group. The new schedule will take effect December 1, 1952. An original committee proposal to raise the dues from $2 to $5 and from $3 to $6 was voted down by the delegates.

New president for the coming year is Harry C. Schmid, State Director of Vocational Education for Minnesota. Charles W. Sylvester, Director of Vocational Education for Baltimore, Maryland, was reelected treasurer for the twenty-fourth time. New vice-presidents elected were Mark Nickols, State Director of Agricultural Education for Utah, for vocational agriculture, and William R. Blackler, Chief, Bureau of Business Education, California, for business education. ★

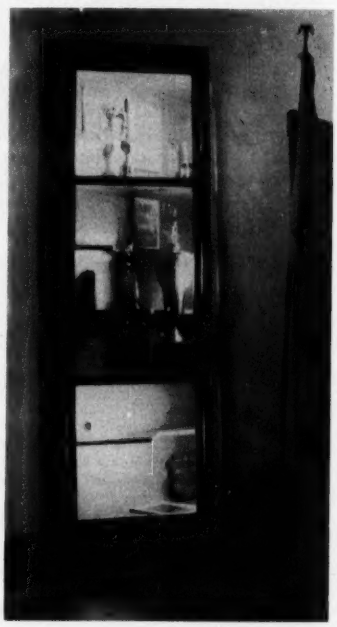
By Aaron Adams
Marion, Ind., High School

A Triangular Trophy Case

By Stan Schirmacher

Cottonwood, Arizona, High School

Here is a showcase that is different. It takes up a minimum amount of space, yet shows up displays to advantage. School colors are painted inside. The outside is left in native cottonwood. Showcase bulbs are in front corner.



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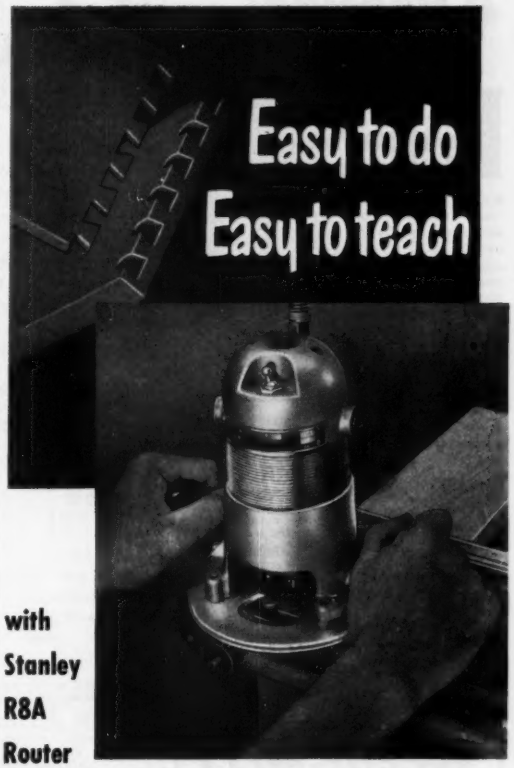

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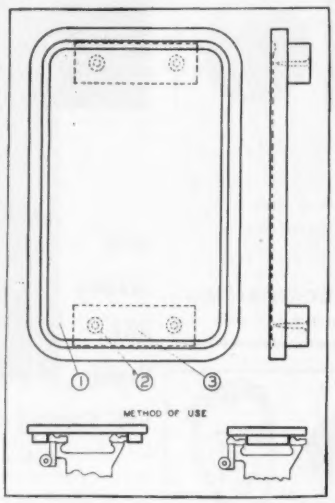
Handy Lathe Tool Tray

Many lathes receive nicks, scratches, and other injuries that interfere with smooth, efficient operation and shorten the life of the machine—all for lack of a place to set files, chisels, and other tools in use. The tool tray shown in the drawing not only protects the lathe ways, but also provides a place conveniently at hand to set tools and pieces of work.



The base (1) is made of ¾" pine of a width to fit the lathe with which it is to be used. The depression and groove, and the shaping of the tray may be chiseled out by hand or routed out by machine. The two cleats (2) are cut from 1" x 2" pine, of a length so they will fit snugly between the inner edges of the lathe bed. They should be placed on the bottom of the base so as to fit snugly against the outer edges of the lathe bed. Set the tray on the lathe either sidewise or endwise as shown. Attach the cleats to the base with flat wood screws through close-fitting holes. —*Albert M. Wilkins, Barrington, Ill.*

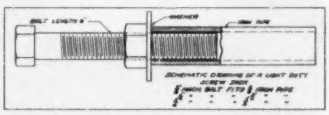
Removing Hand Stains

I have found this system very helpful in removing various types of dirt and stains from shop students' hands. Over the sink I have a shelf with bottles of various solvents labelled by name and use, viz., turpentine (for paint, oil, and varnish); denatured alcohol (for shellac); gasoline (for car oil and grease); and lacquer thinner (for Duco cement and lacquers). I also always have ample supplies of Lava soap and Boraxo.

The solvent bottles are of a nonskid type, and have two small holes punched in the caps for easy and economical dispensing. — *Wallace K. Hart, Dixfield, Me., High School.*

Light, Handy Jack

Once in a long time there comes the need for some tool adapted to pushing things apart instead of clamping things together. Ordinary auto and house jacks are too cumbersome for light work.



The accompanying sketch shows how a length of iron water pipe equipped with a bolt and nut can work well as a jack. The bolt should have a cut thread which runs well up to the head. Operate it with two wrenches—one to hold the head, and the other to turn the nut.— *Paul C. Hoopes, Abraham Clark High School, Roselle, N.J.*

Pied Type

Pied type which has accumulated for some time poses a problem in many school print shops. To simplify this, select an empty California job case for the "pied type case." Assign one or more boys in regular turn to distribute certain amounts of pied type, putting all *a*'s in the *a* box; *b*'s in the *b* box, etc., without regard for size or family. When a large amount of type is compartmented in this way, all the characters in each box are further sorted, eventually getting back to their own case.

This has the advantage of dividing the task into two steps and thus makes it seem less like a long chore. Also, it aids in locating specific letters which are not in the font being used. A quick check-up of that particular letter, or character, in the "pied type case" may result in being able to complete a job being held up for lack of several missing letters.—*Auburn J. Lamb, Anacostia High School, Washington, D. C.*

Drawing Pencil Kink

For putting the proper point on drawing pencils I conserve sanding blocks. To keep students from getting lead dust on their papers and equipment I tack a piece of garnet paper conveniently on the side of each desk.—*H. L. Sosinski, Patton, Pa., Boro High School.*

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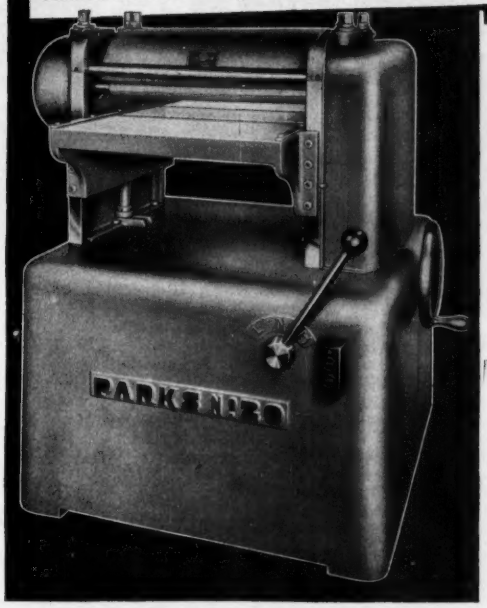

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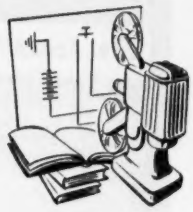


Books:

General Electricity. Board of Education, City of New York, N.Y., 1951. Pp. iv+115. $1.00.

The purpose of this manual is to aid the teacher in presenting the principles of electricity to his class. There are 38 full-page illustrations which clarify the text material. In addition there are many well-organized topical outlines which should simplify the shop talks given in class. Junior-high-school teachers should find this publication helpful in a general electricity class.

This manual was prepared by a committee of junior-high-school teachers under the direction of Jesse G. Fox, Maximillian Komow, John M. Hurley, and Charles G. Fischer, all on the staff of the New York City Schools.

Foundry Work. Doe. New York: John Wiley & Sons, Inc., 1951. Pp. x+108. $1.76.

This book is intended to give a general view of the process of molding and its allied operations. It presents briefly types of patterns, the processes of molding, casting, cleaning, and finishing of castings. It should be of special interest to students who are interested in entering the field, as well as to those who wish to obtain a general picture of the casting of metals. It is well illustrated and it contains a glossary of foundry terms which should prove helpful to anyone who is concerned with this basic industry.

Edwin W. Doe is chairman of the Metal Shops Division, Brooklyn Technical High School, Brooklyn, N.Y.

How to Make Your Own Furniture. Williams. New York: Simmons-Boardman Publishing Corp., 1951. Pp. 175. $3.95.

This book contains an excellent selection of different pieces of furniture. The illustrations given of each piece include suggestions on the details of construction. In addition, one chapter is devoted to a discussion of each of the following topics: setting up shop, tools and equipment, and woods, accessories, and supplies. Woodworking teachers who are interested in making furniture will find the book a worthwhile addition to their reference libraries.

Henry Lionel Williams is the author of several books on early American houses and furniture.

Fundamentals of Supervision. Harad. Albany, N.Y.: Delmar Publishers, Inc., 1951. Pp. viii+215. $3.75.

This book is intended to be used by groups who are studying the problems of the foreman. Set up on a unit basis, the volume is divided into three parts: the supervisor learns about his organization, he learns about himself, and he learns about his workers, with major emphasis on the last section. The book deals with the fundamentals of supervision in a stimulating and thought-provoking manner. Anyone who has the responsibility of conducting foremen's conferences will welcome this book either as a basic text or as a supplement to the material he is using.

Charles F. Harad is Director of Industrial Engineering Associates, Indianapolis, Ind.

Fundamentals of Supervision. Conference Leader's Guide. Harad. Albany, N.Y.: Delmar Publishers, Inc., 1951. Pp. v+73. $2.00.

This book is intended to be used as a guide by leaders of foremen's conferences. It contains topical outlines covering the topics found in *Fundamentals of Supervision*, reviewed above. A conference leader will find in it many suggestions which will make his work more pointed and more meaningful.

Charles F. Harad is Director of Industrial Engineering Associates, Indianapolis, Ind.

Vocational Education in the Netherlands. Holtrop. Berkeley: University of California Press, 1951. Pp. x+127. $1.25.

This bulletin contains a comprehensive description of vocational education in the Netherlands. It gives the historical background of this phase of education as well as of technical education and apprenticeship. It covers the prewar and postwar periods as well as the period of the German occupation. The contents should be of interest to students who are studying European education or who are attempting to compare what is done in Europe with the procedure in this country.

Dr. William F. Holtrop is well qualified to write on this subject as he was born in Holland and received his college education there.

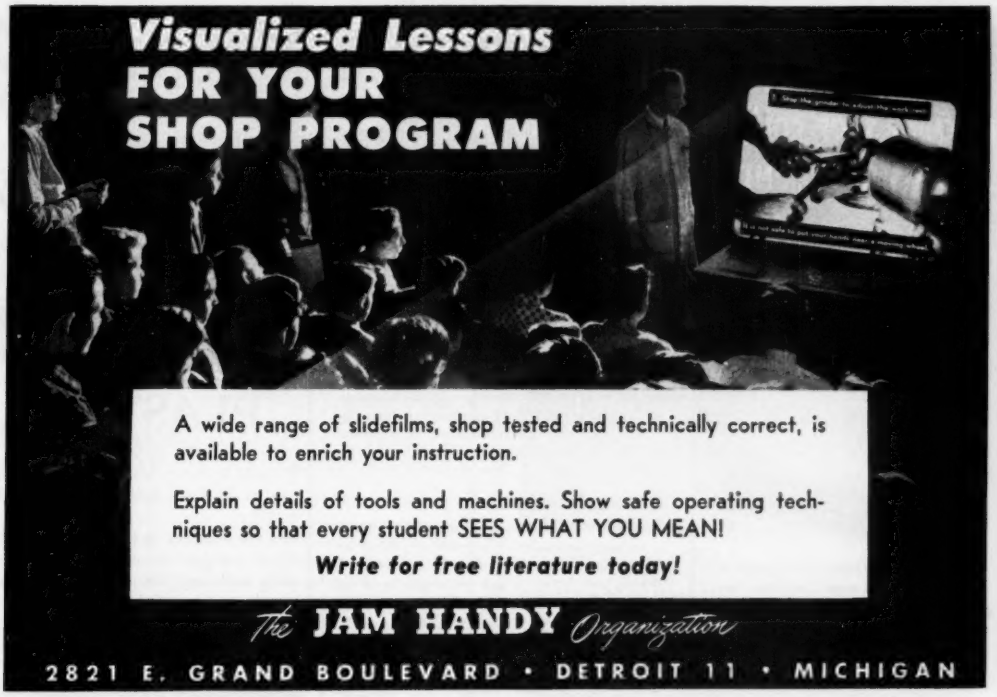
How to Build Games and Toys. Pelton. New York: D. Van Nostrand Co., Inc., 1951. Pp. vi+264. $3.95.

This book tells how to make toys for children of all ages. There are over 200 toys or games presented. These are well illustrated and include some that are simple as well as others which are more difficult. Teachers as well as home craftsmen who are interested in toymaking will find in the book a wealth of material.

B. W. Pelton is the author of a popular book on *Furniture Making and Cabinet Work.*

What to Make. Chicago: Popular Mechanics Press, 1951. Pp. 240. $2.50.

This is the most recent of the publications issued quarterly by the Popular Mechanics Press. In this volume may be found instruc-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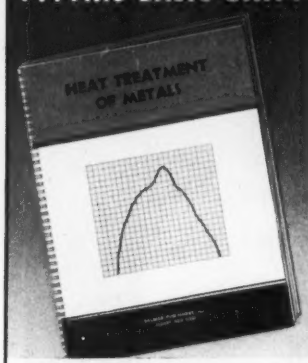

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Make Your Own Modern Furniture. Cherner. New York: McGraw-Hill Book Co., Inc., 1951. Pp. 140. $4.00.

This book contains working plans and room designs, using modern furniture. It is illustrated by 100 drawings, sketches, and photographs. The author explains the practical aspects of modern design and presents helpful suggestions on methods of planning furniture and furnishings for a given space. This book should be helpful to teachers who are responsible for classes in cabinet and furniture making.

Norman Cherner teaches in the Department of Fine and Industrial Arts, Teachers College, Columbia University, New York City.

Pamphlets:

Analysis. This syllabus is intended to guide teachers in analyzing a trade, a job, or an activity. The authors, Harold Silvius, Jack Slagle, and Arthur Elges are members of the staff of Wayne University. Copies are available for 86c from Dr. Silvius, Wayne University, Detroit, Mich.

Glovemaking. The author of this booklet, Natalie S. Woolf, presents material to be used in instructing pupils how to make gloves. It also contains glove patterns for men, women, and children. It may be obtained for $1.50 from McKnight & McKnight, Publishers, Bloomington, Ill.

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Educators Guide to Free Films. $6. **Educators Guide to Free Slidefilms.** $3. Randolph, Wis.: Educators Progress Service, 1951. 100 titles listed in first volume, under "Applied Arts—Shop Work," mostly on metalwork and machine shop. Many titles under "Science" section of both volumes deal with electricity, radio, TV, hydraulics, and automotive engines.

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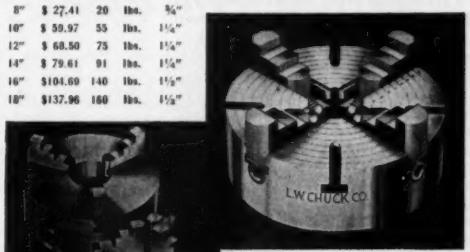

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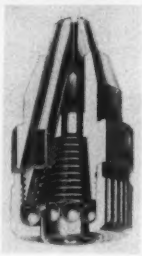

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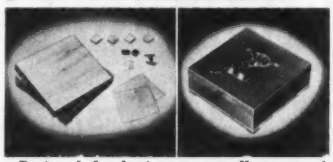

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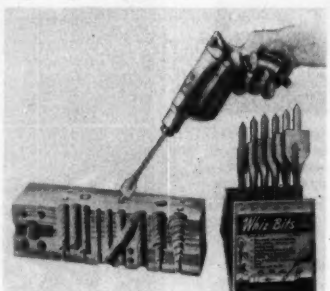

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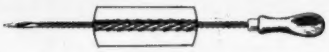

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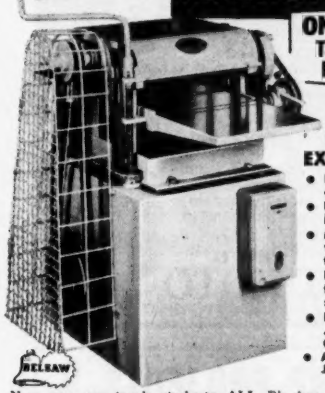

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Washington . . . . *from page 32* the report from this state was still missing, so it could not be determined whether its errors had been corrected.

Travel. — There is good indication, however, that more of its travel budget is being devoted to "compliance" visits to state headquarters, although there is no indication that visits will be made to individual schools. Despite the criticism of the committee, USOE shies from anything which might be interpreted as imposing control at the school or community level.

Appropriations.—USOE is asking for $23,000,000 for grants to states under the George-Barden Act for the 1952-53 fiscal year. As this issue went to press, the request had cleared Federal Security Agency budget officers and was before the Bureau of the Budget.

USOE had appeared before the Budget Bureau with its justification, but had had no indication as to what will be the fate of the request. They were optimistic, however. It will be an increase over funds available for this year.

Also being requested is an appropriation of $550,000 for Division of Vocational Education administrative expenses. This is the limit under the two enabling acts.

In the past, the Division has gotten some travel money from USOE generally, as well as printing and publications funds from either USOE or FSA. Such sums have always been included in assessing the statutory limit.

This year, however, the General Accounting Office has been asked to rule that the Division is also part of USOE and, under the terms of USOE's enabling act, be able to spend more than this sum.

A favorable ruling would greatly help the travel and printing and publications activities of the Division.

Should favorable interpretation be forthcoming, the report of the Expenditures Subcommittee of the House—which criticized the size of the travel budget—will be used to justify more money from the Appropriations Committee.

Steel.—NPA and USOE officials believe that sufficient steel will be available to take care of construction now underway and new starts in "most localities" which have serious overcrowding in elementary and secondary schools.

This appears to be the reaction to an increase of 15,000 tons in the amount of steel allocated for education during the first quarter of 1952, an increased allocation which came as quite a surprise to USOE, the agency which in turn distributes the steel to the schools.

The picture for colleges and libraries is far less bright, since DPA has earmarked only 14,000 tons for such institutions. USOE reports that to continue college, university, and library projects already under construction in the first quarter would require 35,536 tons. Work on some of these must stop, or slow down. New starts scheduled, tentative-

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ly, for the first quarter require 22,878 tons, making a total need for 48,414 tons which is 34,414 tons in excess of steel available.

The additional allocation is a direct result of a "directive" from Congress, in the form of identical resolutions adopted in October by both House and Senate. (See December SCHOOL SHOP.)

Contractors on educational projects who have made reasonable but unsuccessful efforts to find a supplier should report this fact to USOE, which will in turn make the information available to Frank McCue, Assistant Director of NPA Iron and Steel Division, who will assist in finding a supplier.

Fleischmann has indicated that school construction throughout 1952 may go forward at about the same rate it has during 1951, "by far the highest record in the history of education construction."

"While a final decision on allotments to all programs for the second quarter 1952 will not be made until about January 10, it is my judgment that we will be able to support the elementary- and secondary-school construction program in the second quarter at approximately the same level as we have done for the first quarter," he said.

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Reforms.—USOE's Division of Vocational Education is making and has made some "reforms" in its procedures, designed to provide more efficient and streamlined direction of the programs it administers.

While the House Subcommittee which issued a scathing report of USOE (See December SCHOOL SHOP) is claiming credit for these reforms, DVE officials say it is just part of a continuing effort to tighten up and improve administration.

There is some evidence in support of this claim. The report of the subcommittee contains a copy of a memorandum, dated July 6, from Dr. R. W. Gregory, who runs the vo-ed program, to Dr. Earl J. McGrath. This memorandum contains an eight-point program (with four additional subpoints) of moves designed for "firming up . . . (the) administration of the National Vocational Education Acts and will lead to further constructive development by the state boards for vocational education for their respective programs."

Between the date of the hearing before the subcommittee and July 6, insufficient time elapsed, in the opinion of veteran observers familiar with the workings of bureaucratic red tape, for such a lengthy memorandum to be cleared all along the way for final submission to the Commissioner. Many of the administrative "reforms," it is believed, had to be "in the works" prior to the investigation.

USOE reports that all are being inaugurated on schedule, but it is too early to determine whether results will be favorable or unfavorable.

Speed.—One result is already known, and it is not decisive. By writing a great many more letters, and sending telegrams, more state reports have been submitted on time—but, by the end of November, several state reports had not been submitted.

Officials are not worrying too much about this since earlier reporting is impossible they point out because of the fiscal practices in some states.

Moreover, Federal Security Agency legal talent has ruled that statutory deadlines are not "hard and fast."

Finally, nothing can be done if a state does not meet the September deadline. Under the George-Barden Act, first-half allocations are made on July 1. No matter how late a state report may be, it is usually in before second-half allocations are made.

The September deadline was established in the Smith-Hughes Act, but the George-Barden provisions confuse the issue. No attempt will be made to ask Congress to alter the date, because there is always the chance that one alteration may lead to others — some of which might materially alter the program.

USOE also points out that when the deadline was written into the law, expenditures were small. Government funds have increased about 15 times; state money about 40 to 50 times. With the increased size of the program, it becomes increasingly difficult to prepare the state reports.

Review.—USOE is not attempting to speed up its review of the state reports. To do so, it is pointed out, would be impractical. One professional employee, assisted by two statistical clerks, is assigned to review the 51 annual reports that come in. These reports cannot be reviewed in a month. This small staff, by working at a normal speed, does the work in a year. By vastly increasing the size of this staff, the programs could be reviewed in a month, or in any given time.

But when the programs were reviewed, the large staff would be idle for the balance of the year. Since the work requires professional ability, the staff could not be diverted to other work without reducing the quality of its work one place or another.

Sanctions.—USOE also suggests that the many errors found in the state reports are minor in character, and under no circumstances are grounds for sanctions.

The Smith-Hughes Act provides for two sanctions. Funds, in an equal amount, may be withheld from a state found guilty of expending money for purposes other than those provided in the Act.

When a state flagrantly abuses the purposes of the Act, funds may also be withheld. This sanction covers, among other things, embezzlement. It has been applied twice. Once, when embezzlement was found, the state's funds were withheld until the amount of the embezzlement had been returned to the federal government. It was applied another time when Louisiana's acceptance law was appealed. When Louisiana proved it had an acceptance law, the program was reinstated.

In the case of the unidentified state whose report was found to be in error in 17 instances, USOE officials said that not one of the errors was one which, under the law, required sanctions.

The subcommittee report said that these 17 errors "went to the very heart of the program" and that "obviously the state should not have been certified."

In late November, USOE officials said

(*Continued on page* 30)

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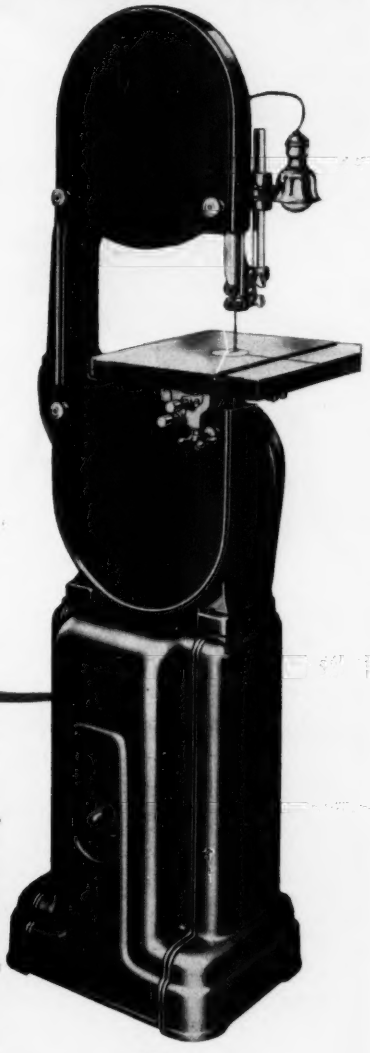

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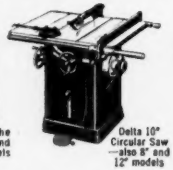

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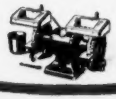

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